REMARKS

The claims have been amended to more clearly claim the invention. Support for the amendment to Claim 1 can be found in the Specification and claims as filed, for example, Page 2, lines 1-3; page 13, lines 24-27; page 17, lines 26-31; page 13, line 29 through page 14, line 2; and the Figure legends. The changes made to the Specification and Claims by the current amendment, including ~~deletions~~ and additions, are shown herein with deletions designated with a strikethrough and additions underlined. No new matter has been added herewith.

Background Discussion of Bone resorption and Paget's disease

Over the course of one's lifetime, bones are constantly in a state of remodeling. The process involves both bone resorption and bone formation. Abnormalities in either or both of these processes can result in weakening and/or abnormal formation of bone. For example a bone may be weak due to a reduction in bone formation. Alternatively a bone may be weak due to an increase in bone resorption. Bone resorption is mediated by osteoclasts, while bone formation is mediated by osteoblasts.

Paget's disease which is mentioned in the specification, is characterized by weak bones and an explanation of the disease can be found on any website or reference book known to one of skill in the art, including, for example, Family Practice Notebook.com, www.osteo.org, and www.arthritis.ca (see also Appendix A). The initial abnormality in Paget's disease is a dramatic increase in the rate of bone resorption which can be explained by the fact that Pagetic osteoclasts are abnormal – approximately five times larger than normal and containing about 20 nuclei per cell rather than the normal three. The osteoblasts are unaffected, but, because bone resorption triggers bone formation, the rate of bone resorption is matched by a rapid rate of bone formation. The new bone is structurally disorganized. It is clear then, that the treatment for Paget's disease would be to decrease **bone resorption**, as opposed to increasing **bone formation**. A treatment that increases bone formation would result in even more abnormal bone formation and a treatment that reduces bone formation would result in a more weakened bone.

The specification on page 18, line 13-18 shows that leptin had no effect on osteoblasts and had a clear effect on osteoclasts, inhibiting the activity by 80%. Thus, the results in the specification show that leptin is an inhibitor of bone resorption and has no effect on bone

formation. Thus, leptin would be an ideal treatment for a disease of bone resorption such as Paget's disease.

The prior art references, Liu et al and Ke et al, both teach methods for increasing bone formation in patients with reduced bone formation. They do not teach or suggest methods of decreasing bone resorption.

Priority

Applicants would like the Examiner to note that a certified copy of the Australian priority application was submitted with the IDS of January 31, 2005. The priority document is also available through the USPTO's Patent Application Information Retrieval system.

Rejection under 35 U.S.C.§112, second paragraph

The Examiner has rejected Claim 1 as indefinite for the recitation of "modulating bone resorption" and "wherein said modulation is a reduction" because the Examiner believes this is comparable to having broad language followed by "such as" and then narrow language. The Examiner suggests amending the claim to read "A method of inhibiting bone resorption."

Without acquiescing to the Examiner's analysis, in the interest of expediting prosecution of the present application, Applicants have amended the claim as suggested by the Examiner.

Rejection under 35 U.S.C.§102(e)

The Examiner has rejected Claims 1-9 and 17-18 as anticipated by Ke et al. (U.S. Pat. No.: 6,352,970.

The Examiner states that although Ke et al. does not teach the use of leptin to inhibit bone resorption, the method of augmenting bone mass taught by Ke et al. would inherently result in the inhibition of bone resorption.

> To be anticipatory under 35 U.S.C. § 102, a reference must teach each and every element of the claimed invention. *See Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379 (Fed. Cir. 1986). "Invalidity for anticipation requires that all of the elements and limitations of the claim are found within a single prior art reference. ...There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention." *See Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565 (Fed. Cir. 1991).

Claim 1 as amended reads as follows:

1. A method of inhibiting, reducing or otherwise delaying onset or progression of bone resorption in an animal, said method comprising:
identifying an animal with an excess of bone resorption;
administering to said animal an effective amount of a leptin or a derivative, homologue, analogue, chemical equivalent, antagonist or agonist thereof for a time and under conditions sufficient to inhibit, reduce or otherwise delay onset or progression of bone resorption.

The method includes the step of "identifying an animal with an excess of bone resorption."

As discussed above in the discussion on bone resorption and Paget's disease, bone resorption is involved in the growth, repair and aging of bone. Bone formation involves osteoblasts and bone resorption involves osteoclasts. Paget's disease is an example of a disease in which abnormal osteoclasts result in increased bone resorption. This triggers increased the normal osteoblasts to increase bone formation and results in bones with a weakened and structurally disorganized architecture. It is clear that a treatment for bone formation would have no effect on such a disease and would not result in a more normal bone architecture. Thus, Paget's disease is an example of a disease which can only be treated by reducing bone resorption. Thus, the step of identifying an animal with an excess of bone resorption is a key part of the treatment of such a disease.

As stated in the specification in Example 2, leptin was found to decrease bone resorption when osteoclasts were treated . . .while it had no effect on osteoblasts. Thus, leptin was a potent inhibitor of osteoclastogenesis and, thus, of bone resorption.

As stated above, to be anticipatory, the reference must teach all of the elements and limitations of the claim. Ke et al. teach only a method of augmenting bone mass. Ke et al. do not teach or suggest identifying an animal with an excess of bone resorption, as Ke et al. teach nothing about whether the effect they observe relates to bone resorption or bone formation. In fact, by teaching only that bone mass is augmented, Ke et al. actually suggest that the effect is through bone formation. Accordingly, Ke et al. does not teach all of the claim elements and Ke et al does not anticipate the claims.

Applicants respectfully request withdrawal of the rejection under 35 U.S.C.§102(e).

Rejection under 35 U.S.C.§103(a)

The Examiner has rejected Claims 1-9 and 17-18 as being unpatentable over Liu et al. (ASBMR, 19th Annual Meeting Abstract No. 50). The Examiner believes that a method of treating bone formation encompasses the same patient population as a method of inhibiting bone resorption and the Examiner does not give the preamble of the claim any patentable weight.

The law is clear that three basic criteria must be met to establish a *prima facie* case of obviousness: (MPEP ¶2143):

> First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references, when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure (*In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1440 (Fed. Cir. 1991)). (Underline added for emphasis)

Claim 1 as amended reads as follows:

> 1. A method of inhibiting, reducing or otherwise delaying onset or progression of bone resorption in an animal, said method comprising:
> identifying an animal with an excess of bone resorption;
> administering to said animal an effective amount of a leptin or a derivative, homologue, analogue, chemical equivalent, antagonist or agonist thereof for a time and under conditions sufficient to inhibit, reduce or otherwise delay onset or progression of bone resorption.

The Examiner states that "a method of treating bone formation encompasses the same patient population as a method of inhibiting bone resorption." However, as discussed above, Paget's disease is clearly a disease of bone resorption and not a disease of bone formation. Thus, the Examiner is incorrect in her assumption that the methods encompass the same population.

In addition, the Examiner stated that the method of inhibiting bone resorption would be given no patentable weight because it was only stated in the preamble. The claim has now been amended to expressly state that the leptin is administered in an amount effective to: to inhibit, reduce or otherwise delay onset or progression of bone resorption, thus giving it patentable weight.

Further, the claim has been amended to include a step of "identifying an animal with an excess of bone resorption." As stated in response to the anticipation rejection, this is important because diseases such as Paget's disease are purely disease of excess bone resorption. A treatment which increased bone formation would not treat the disease and might even make the abnormal bone formation worse.

Liu et al does not teach all of the claim limitations

Liu et al. teaches only stimulation of bone formation by Leptin (see 2nd paragraph, line 7-10 in the abstract). Liu et al does not teach or suggest a step of identifying an animal with a bone resorption problem and treating that problem with Leptin. Thus, Liu et al. does not teach or suggest all the claim limitations.

Liu et al neither teach nor suggest treatment of bone resorption

There is no suggestion or motivation in Liu et al. to suggest that leptin can be used for inhibition of bone resorption - only increased bone formation. Because the two processes are effected by different cells (Osteoblasts for bone formation and Osteoclasts for bone resorption – see page 2, lines 2-3 of the Specification), there would be no reasonable expectation of success because there would be no expectation that Leptin would work the two cells in an opposite manner. Further, Liu et al. would teach away from using Leptin to treat a disease of bone resorption because as stated above in the discuss on Paget's disease, the response of the normal osteoblast to an abnormal increase in bone resorption is to increase bone formation. Therefore, during the normal progress of the disease, bone formation would have already been increased and an effective treatment would not be to further increase bone formation, but to decrease bone resorption.

The use of Leptin to treat bone resorption is a surprising result

Previous results showed that Leptin increased bone formation, thus, the fact that Applicants found that Leptin, in fact decreased bone resorption and could be used for diseases of bone resorption such as Paget's disease was a surprising result.

In view of the above arguments and amendments, Applicants respectfully request withdrawal of the rejection under 35 U.S.C.§103(a).

Conclusion

Applicants believe that the current amendments place the application in condition for examination. Should there be any questions which might result in a delay in examination, the examiner is respectfully requested to contact the undersigned at the telephone number appearing below. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: May 13, 2005

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Paget's Disease of Bone

Paget's Disease Osteitis Deformans

I. Epidemiology

A. Onset over age 50 years
B. Prevalence (United States)
    1. Overall: 3%
    2. Age over 80 years: 10%
C. Ethnicity
    1. Rare in Asia
    2. Common in United States, Australia, and New Zealand

II. Pathophysiology

A. Associated factors (etiology unknown)
    1. Viral antigen association (especially Measles)
    2. Family history (Chromosome 18q)
B. Phases
    1. Phase 1: Intense Osteoclastic activity
        a. Bone resorption predominates
        b. Bone turnover is 20 times normal rate
    2. Phase 2: Osteolytic-Osteoblastic activity
        a. Woven bone formation
        b. Ineffective mineralization
    3. Phase 3: Dense bone deposition
        a. Bone is disorganized and sclerotic
        b. Weaker than normal bone
C. Distribution
    1. Pelvis (72%)
    2. Spine
        a. Lumbar (58%)
        b. Thoracic (45%)
        c. Cervical (14%)
    3. Skull (42%)
    4. Long bones
        a. Femur (55%)
        b. Tibia (35%)
        c. Humerus (31%)

III. Symptoms (Asymptomatic in 70% of cases)

A. Constant pain
B. Pain provocative factors
    1. Rest or night pain

Absorptiometry
Quantitative Computed Tomography
Calcaneal Ultrasonography

2. Weight bearing
3. Warming

IV. **Signs**
- A. Kyphosis
- B. Limb shortening or bowing
- C. Frontal forehead bossing
- D. Skull enlargement
- E. Loose teeth

V. **Labs**
- A. Alkaline Phosphatase
  1. Total serum Alkaline Phosphatase
  2. Bone specific Alkaline Phosphatase
- B. Urinary hydroxyproline no longer used as marker

VI. **Radiology: XRay**
- A. General changes
  1. Combined lytic lesions with nearby sclerosis
- B. Skull changes
  1. Osteoporosis circumscripta
- C. Long bone changes
  1. Flame-shaped changes
  2. Limb bowing
  3. Fractures (banana-shaped transverse fractures)

VII. **Radiology: Bone Scan (Technetium-99m)**
- A. Focal areas of uptake
- B. Appearance of Mouse-face on vertebrae

VIII. **Monitoring**
- A. Screening if first degree relative has Paget's Disease
  1. Alkaline Phosphatase every 3 years (over age 50)
- B. Monitoring of diagnosed Paget's Disease
  1. Alkaline Phosphatase every 3 to 12 months

IX. **Associated conditions**
- A. Malignant degeneration (up to 10% of Paget's Disease)
  1. Osteosarcoma
  2. Fibrosarcoma
  3. Spindle cell sarcoma
- B. Pseudomalignancy (Pseudosarcoma or pseudo giant cell)
- C. Osteoarthritis (Paget's disease involving joint)
- D. Nephrolithiasis
- E. Nerve compression syndromes from direct pressure
  1. Hearing Loss
  2. Spinal stenosis
  3. Neuropathic pain, weakness or Paresthesias

X. **Management: General Measures**
- A. Adequate pain control
- B. Calcium Supplementation 1500 mg qd
- C. Vitamin D 400 IU per day
- D. Low impact Exercise

E. Avoid straining affected bone

XI. **Management: Suppress bone resorption (Osteoclasts)**
- A. Indications
  1. Symptomatic patients
  2. Alkaline Phosphatase >125 to 150% of normal
- B. First line agents: Bisphosphonates
  1. Alendronate (Fosamax) 40 mg qd for 6 months
  2. Pamidronate (Aredia) intravenous
- C. Alternative agents (not as potent as Bisphosphonates)
  1. Calcitonin 100 U SC or IM qd for 6 to 18 months

XII. **References**

- A. Simon in Klippel (1997) Primer Rheumatic, p. 382-4
- B. *Schneider (2002) Am Fam Physician 65(10):2069-72*

The Management of Paget's Disease of Bone

Introduction

Paget's disease of bone is the second most common bone disease in the world. Prevalence in the population ranges from 1.5% to 8% depending on the person's age and the area of the world where he or she lives. During the past six years, several effective therapies for Paget's disease have been approved in the US. However, despite the relatively high incidence of Paget's disease and the emergence of new therapies, many patients have difficulty finding appropriate treatment.

To address this problem, The Paget Foundation for Paget's Disease of Bone and Related Disorders with support from the NIH Osteoporosis and Related Bone Diseases~National Resource Center has launched an educational outreach project to make health professionals aware of current thinking on the diagnosis and treatment of Paget's disease. *The Management of Paget's Disease of Bone* provides basic information on the pathology, clinical presentation, diagnosis, indications for treatment and available therapy.

The manuscript was written by Dr. Kenneth W. Lyles, Professor of Medicine, GRECC, VA Medical Center, Duke University Health System, Durham, NC; Dr. Ethel S. Siris, Madeline C. Stabile Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons, New York, NY; and Dr. Frederick R. Singer, Director, Endocrine/Bone Disease Program, John Wayne Cancer Institute at Saint John's Health Center, Clinical Professor of Medicine, UCLA School of Medicine, Santa Monica, CA. The authors also are officers of the Board of Directors of The Paget Foundation. Dr. Lyles is Secretary-Treasurer; Dr. Siris is Vice Chairman and Dr. Singer is Chairman.

The opinions and recommendations in this publication are those of the authors and do not necessarily reflect the views of the National Institutes of Health.

What is Paget's Disease ?

First diagnosed by Sir James Paget in 1877, Paget's disease of bone, or osteitis deformans, is a disease of the osteoclast and is the most exaggerated example of disordered bone remodeling. It is a focal disorder of accelerated skeletal remodeling that can involve a single bone or multiple bones. Paget's disease is characterized by excessive bone resorption followed by excessive bone formation, resulting in bone that is architecturally unsound. This often leads to bone pain, bone deformity and skeletal fragility.

Pathology of Paget's Disease

The initial abnormality in Paget's disease is a dramatic increase in the rate of bone resorption at areas of heightened bone remodeling. Pagetic osteoclasts are abnormal -- approximately five times larger than normal containing an average number of 20 nuclei per cell compared with three to four nuclei in normal adult osteoclasts. The osteoblasts are not affected, however. This extreme difference in size between the two cell types causes the intensely elevated rate of bone resorption. Because bone resorption triggers bone formation, the rate of bone resorption is matched by a rapid rate of bone formation. The new bone is structurally disorganized, however, resulting in an overall decrease in bone strength and an increase in susceptibility to bowing and fractures. In addition, the abnormal bone is marked by a high level of vascularity and an excess of fibrous connective tissue in the marrow.

Clinical Presentation of Paget's Disease

While any bone may be affected by Paget's disease, the most commonly involved bones are the pelvis, vertebrae, skull, femur and tibia. Prevalent signs and symptoms of Paget's disease are bone pain and skeletal deformity. Bone pain usually results from the rheumatologic and neurologic complications of the disease rather than from the pagetic lesions themselves. When bone pain does occur among patients, its onset is frequently late in the disease process and is usually unrelated to physical activity. Pain from a pagetic lesion in the femur or tibia, however, may increase with weight bearing.

Skeletal deformities that occur as a result of Paget's disease are most often noted in the lower extremities and the skull. Long bones tend to exhibit bowing, while the skull can become enlarged. An enlarged skull can lead to headaches or hearing loss when the disease affects the temporal bone. When present in the spine, the increased bone volume causes compression of the spinal cord or nerve roots and may result in severe pain and impaired neurological function. In addition, the skin over the pagetic lesions is frequently warm due to the increased blood flow to the lesions.

A number of complications may result from Paget's disease. Of these, the most devastating is a transformation of the bone that becomes cancerous. Osteosarcoma or other types of sarcoma occurs in less than 1 percent of patients with Paget's disease, but at a significantly higher rate than in non-affected individuals. Osteosarcoma contributes significantly to the death rate from Paget's disease.

Diagnostic Evaluation and Recommendations

Paget's disease can be diagnosed in patients through radiology, radionuclide bone scanning, biochemical testing of bone resorption parameters, or biochemical testing of bone formation parameters. When tested through roentgenographic or radiographic means, Paget's disease displays three distinctive stages. In the earliest stage of the disease, an osteolytic lesion may be observed in the skull or a long bone. In the second stage of the disease, x-rays reveal both osteolytic and sclerotic changes in the same bone. In the last stage of the disease, the sclerotic lesion dominates the bone and there may be an increase in the dimensions of the bone itself. A radionuclide bone scan using a radiolabeled bisphosphonate is the most efficient means of detecting Paget's disease in the skeleton. The bisphosphonate is injected intravenously and is concentrated in areas of increased blood flow and high levels of bone formation, both common characteristics of Paget's disease. This test is used primarily to establish the full extent of skeletal involvement for a patient.

Biochemical tests reflecting osteoclast activity and resultant bone collagen resorption include measurements of urinary hydroxyproline/creatinine as well as measurements of urinary and serum deoxypyridinoline, N-telopeptide and C-telopeptide. As a marker of osteoblast activity, the measurement of serum total alkaline phosphatase activity provides a general indication of bone turnover and disease activity in Paget's disease.

At least one measurement of bone metabolic activity and x-rays of affected bones are the minimum recommended level of evaluation to track and monitor the progression of treatment in a patient with Paget's disease. For most patients, a decrease in the total serum alkaline phosphatase activity is sufficient to indicate and determine changes in overall disease activity. Since the total serum alkaline phosphatase level is a reflection of both the total bone surface affected by Paget's disease as well as the total activity of the disease at those sites, serum alkaline phosphatase can be normal in patients with a small focus of symptomatic Paget's disease. Serial radiographs should be performed on those patients with lytic lesions in weight-bearing long bones in order to document healing. A bone scan is valuable in defining the full extent of the disease and identifying asymptomatic lesions located in "at risk" areas.

Indications for Treatment

Treatment for Paget's disease is based upon antiresorptive therapy. There are four general indications for treatment of Paget's disease:

1. Symptoms due to metabolically active Paget's disease warrant treatment. This includes bone pain related to a pagetic site or fatigue fracture, headache resulting from an affected skull, back pain from affected pagetic vertebrae or other neurological syndromes associated with pagetic changes.

2. Treatment is warranted in a patient planning to undergo elective surgery on a pagetic site, such as hip replacement, in an attempt to minimize the operative blood loss due to hypervascularity present in active pagetic bone.

3. Treatment is indicated in the management of hypercalcemia, a rare occurrence when a patient with multiple bones affected by Paget's disease and a highly elevated serum alkaline phosphatase level undergoes prolonged immobilization.

4. Many investigators believe that treatment is indicated as an attempt to decrease local

progression and reduce the risk of future complications -- even in asymptomatic patients whose sites of disease and degree of metabolic hyperactivity place them at risk of progression and complications. This group includes individuals who may be at risk for bowing deformities in their long bones; for hearing loss because of skull enlargement; for neurological complications due to pagetic changes in their vertebrae; or for secondary arthritis as a complication of Paget's disease located next to major joints.

There is no direct evidence that aggressive treatment of Paget's disease is associated with prevention of progression or reduction in risk of future complications. Investigators have looked to indirect evidence, however, to suggest this possibility. This evidence includes:

- The failure to treat Paget's disease has been associated with the further destruction of the bone and the progression of bone deformities;
- Successful treatment of Paget's disease has been associated with restoration of normal patterns of new bone deposition; and
- One study has shown that facial and skull deformities improved after successful treatment.

Some investigators conclude, therefore, that it is good clinical practice to treat both symptomatic patients whose symptoms may respond to a reduction in abnormal bone turnover as well as asymptomatic patients with active Paget's disease.

Therapy Options

Four main methods of treatment exist for a patient with Paget's disease: non-pharmacological therapy (focusing mainly on physical therapy as a means of improving muscle strength to help control some types of pain); pharmacological therapy using either bisphosphonates or calcitonins; pain management using analgesics; or surgery.

Pharmacological Treatment

Bisphosphonates

Bisphosphonates suppress or reduce bone resorption by osteoclasts. They do this both directly, by hindering the recruitment and function of osteoclasts and perhaps indirectly, by stimulating osteoblasts to produce an inhibitor of osteoclast formation. There is now a reasonable understanding of how these drugs work and the differences between the various types of bisphosphonates are better understood.

Currently, five bisphosphonates are approved by the US Food and Drug Administration for the treatment of Paget's disease. These include pamidronate, which is given intravenously, and etidronate, tiludronate, alendronate and risedronate, all of which are taken orally.

A mild form of Paget's disease can be suppressed with one or two 60 mg infusions of pamidronate, while a more severe manifestation of the disease may require several infusions of 60-90 mg of pamidronate on a weekly or twice-weekly basis. Serum alkaline phosphatase testing should occur approximately two to three months after the appropriate amount of infusions is administered. Oral calcium and vitamin D supplementation is recommended for patients using

this therapy to lessen hypocalcemia, a common side effect.

Both alendronate and risedronate have been shown to reduce the biochemical indices for bone turnover into the normal range in patients with a moderate-to-severe form of Paget's disease.

Alendronate is taken as a daily 40 mg tablet for six months; risedronate is taken as a daily 30 mg tablet for two or three months. Calcium and vitamin D supplementation is also recommended for patients using either of these drugs.

Etidronate and tiludronate are less potent than alendronate and risedronate. They are both taken as daily 400 mg tablets. Etidronate -- the original bisphosphonate used in treating Paget's disease -- is taken for six months, while tiludronate is taken for three months. With both of these bisphosphonates, calcium supplements should not be taken for several hours following the bisphosphonate dose.

Investigators have recognized that secondary resistance to individual bisphosphonates can occur. Therefore, it may be necessary for a patient to use more than one bisphosphonate in long-term management of the disease. Due to certain properties of each of these medications, it is vital that patients take oral bisphosphonates in their prescribed manner to avoid poor absorption of the drugs or severe gastrointestinal problems.

Calcitonins

Subcutaneous injection of salmon calcitonin was the first widely utilized therapy for Paget's disease. Salmon calcitonin has been shown to reduce elevated indices of bone turnover by 50 percent, decrease symptoms of bone pain, reduce warmth over affected bones, improve some neurological complications and promote healing of lytic lesions. Its use today is limited mostly to patients who do not tolerate bisphosphonates. In the case of secondary resistance to salmon calcitonin, a switch to bisphosphonate therapy is necessary.

Pain Management: Analgesics

Pain directly attributable to Paget's disease is generally relieved through anti-osteoclast treatment as described above. Some pain may be the result of bone deformity or arthritic or neurological complications. In this case, acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDS), or the new cox-2 inhibitors may be helpful for the management of pagetic pain in addition to the main pagetic therapy chosen.

Surgery

Different orthopedic interventions may be necessary in pagetic patients:

- Fixing a complete fracture through pagetic bone;
- Realigning the knee through tibial osteotomy to decrease mechanical pain, particularly if medical therapy is unsuccessful in managing severe pain symptoms; and/or

- Replacing the hip and/or knee through total joint arthroplasty for patients unresponsive to anti-osteoclast treatment and therapy for the osteoarthritis.

When repairing a pagetic fracture, total immobilization of that site should be avoided if possible. In all cases of surgical intervention, pre-treatment with a potent bisphosphonate is very important. Since hypervascularity is a symptom of active Paget's disease, this may lead to serious bleeding during an operation. Pre-treatment with a bisphosphonate will reduce the hypervascularity and reduce the risk of greater-than-normal operative blood loss.

Conclusion

The development of specific inhibitors of osteoclast-mediated resorption, particularly the potent bisphosphonates, has brought about major changes to the treatment of Paget's disease in the past 25 years. Although the long term effects of disease suppression is unknown, the capacity to restore the bone remodeling process to normal gives reason to believe that reduction in long term complications and their related morbidity is now possible.

Bisphosphonates Approved for Paget's Disease of Bone
(Listed in Chronological Order of FDA Approval)

I. Bisphosphonates	Administration and Dosage	Cost
Etidronate Trade Name: **Didronel®** (Procter & Gamble) FDA approval: 1977	• Tablet • 200 to 400 mg once daily for 6 months • 200-400 mg dose is approved; 400 mg dose is preferred • Must be taken with 6-8 ounces of water on an empty stomach (no food, beverages, or medications for 2 hours before and after dose). • Course of Didronel® should not exceed 6 months. • Repeat courses can	**Average cost:** $763.35 for 6-month dose of 400 mg tablets

	be given after rest periods of 3-6 months duration.	
Pamidronate Trade Name: **Aredia®** (Novartis) FDA approval: 1994	• Intravenous • Approved regimen is 30 mg intravenous infusion over 4 hours on 3 consecutive days • A more commonly used regimen is a 60 mg or 90 mg intravenous infusion over 2-4 hours and repeated as clinically indicated. • A single infusion is sometimes effective in mild disease; 2-3 or more infusions may be required in more severe disease. • A course of Aredia® may be readministered at intervals as needed.	**Average cost:** $222.11 for one 30 mg vial, $888.45 for a box of four vials Additional fees charged by the hospital or clinic for administration of the drug
Alendronate Trade Name: **Fosamax®** (Merck) FDA approval: 1995	• Tablet • 40 mg once daily for 6 months • Must be taken on an empty stomach, with 6-8 ounces of water, in the morning. • Wait at least 30 minutes after taking Fosamax® before eating any food, drinking anything other than tap water, or taking any medication. • Do not lie down for	**Average cost:** $955.00 for 6-month dose of 40 mg tablets 40 mg Fosamax® is now available only by mail order through the Paget's Patient Support Program, administered by CVS ProCare. Up to 6 months of additional treatment will be provided at no charge if, after completing 6 months of therapy, further therapy is required. For information,

	at least 30 minutes after taking Fosamax®. (Patient may sit.)	call 1-888-900-3232.
Tiludronate Trade Name: **Skelid®** (Sanofi-Synthelabo, Inc.) FDA approval: 1997	• Tablet • 400 mg (two 200 mg tablets) once daily for 3 months • Must be taken on an empty stomach with 6-8 ounces of water. • Skelid® may be taken any time of day, as long as there is a period of 2 hours before and after resuming food, beverages, and medications.	**Average cost:** $1,352.86 for 3-month dose of 400 mg (two 200 mg tablets)
Risedronate Trade Name: **Actonel®** (Procter & Gamble/Aventis) FDA approval: 1998	• Tablet • 30 mg once daily for 2 months • Must be taken on an empty stomach, with 6-8 ounces of water in the morning. • Wait at least 30 minutes after taking Actonel® before eating any food, drinking anything other than water, or taking any medication. • Do not lie down for at least 30 minutes after taking Actonel®. (Patient may sit.)	**Average cost:** $772.80 for 2-month dose of 30 mg tablets

Other Medications Approved for Paget's Disease of Bone

II. Calcitonin	Administration and Dosage	Cost
Trade Name: **Miacalcin®** (Novartis) Approved by FDA 1990	• Injection • 50 to 100 units daily or 3 times per week for 6-18 months	Injection: $1,468.35 for 100 units/day taken daily for 6 months

For more information about **Paget's Disease of Bone**, contact:

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Information for Patients About Paget's Disease of Bone

What Is Paget's Disease of Bone?

Paget's disease is a chronic disorder that can result in enlarged and misshapen bones. The excessive breakdown and formation of bone tissue causes affected bone to weaken – resulting in bone pain, misshapen bones, fractures, and arthritis in the joints near the affected bones. Paget's disease typically is localized, affecting just one or a few bones, as opposed to osteoporosis, for example, which affects all the bones in the body. Scientists do not know for sure what causes Paget's disease. In some cases, the disease runs in families, and so far two genes have been identified that predispose affected people to develop Paget's disease. In most cases, however, scientists suspect that environmental factors play a role. For example, scientists are studying the possibility that a slow-acting virus may cause Paget's disease.

Who Is Affected?

An estimated one million people in the U.S. have Paget's disease, or about 1.3 people per 100 men and women age 45 to 74. The disease is more common in older people and those of Northern European heritage. Men are about twice as likely as women to have the disease. Research suggests that a close relative of someone with Paget's disease is seven times more likely to develop the disease than someone without an affected relative.

What Are the Symptoms?

Many patients do not know they have Paget's disease because they have no symptoms. Sometimes the symptoms may be confused with those of arthritis or other disorders. In other cases, the diagnosis is made only after complications have developed.

Symptoms can include:

- **pain,** which can occur in any bone affected by the disease or result from arthritis, a complication that develops in some patients.
- **headaches and hearing loss,** which may occur when Paget's disease affects the skull.
- **pressure on nerves,** which may occur when Paget's disease affects the skull or spine.
- **increased head size, bowing of a limb, or curvature of the spine,** which may occur in advanced cases.
- **hip pain,** which may occur when Paget's disease affects the pelvis or thighbone.
- **damage to cartilage of joints,** which may lead to arthritis.

Any bone or bones can be affected, but Paget's disease occurs most frequently in the spine, pelvis, legs, or skull. Generally, symptoms progress slowly, and the disease does not spread to normal bones.

How Is It Diagnosed?

Paget's disease is almost always diagnosed using x rays but may be discovered initially by either of the following tests:

- **Alkaline phosphatase blood test** – An elevated level of alkaline phosphatase in the blood can be suggestive of Paget's disease.
- **Bone scans** – Bone scans are useful in determining the extent and activity of the condition.

If a blood test or bone scan suggests Paget's disease, the affected bone(s) should be x rayed to confirm the diagnosis.

Early diagnosis and treatment are important to minimize complications. Siblings and children of people with Paget's disease may wish to have an alkaline phosphatase blood test every two or three years starting around the age of 40. If the alkaline phosphatase level is higher than normal, a bone scan may be used to identify which bone or bones are affected and an x ray of these bones is used to verify the diagnosis of Paget's disease.

What Is the Prognosis?

The outlook for people diagnosed with Paget's disease is generally good, particularly if treatment is given before major changes in the affected bones have occurred. Treatment can reduce symptoms but is not a cure. Osteogenic sarcoma, a form of bone cancer, is an extremely rare complication that occurs in less than one percent of all patients with Paget's disease.

What Other Medical Conditions May It Lead to?

Paget's disease may lead to other medical conditions, including:

- **Arthritis** – Long bones in the leg may bow, distorting alignment and increasing pressure on nearby joints. In addition, pagetic bone may enlarge, causing joint surfaces to undergo excessive wear and tear. In these cases, pain may be due to a combination of Paget's disease and osteoarthritis.
- **Hearing loss** – Loss of hearing in one or both ears may occur when Paget's disease affects the skull and the bone that surrounds the inner ear. Treating Paget's disease may slow or stop hearing loss. Hearing aids may also help.
- **Heart disease** – In severe Paget's disease, the heart works harder to pump blood to affected bones. This usually does not result in heart failure except in some people who also have hardening of the arteries.
- **Kidney stones** – Kidney stones are more common in patients with Paget's disease.
- **Nervous system problems** – Pagetic bone can cause pressure on the brain, spinal cord, or nerves and reduced blood flow to the brain and spinal cord.
- **Sarcoma** – Rarely, Paget's disease is associated with the development of a malignant tumor of the bone. When there is a sudden onset or worsening of pain, sarcoma should be considered.
- **Loose teeth** – When Paget's disease affects the facial bones, the teeth may loosen. This may make chewing more difficult.
- **Vision loss** – Rarely, when the skull is involved, the nerves to the eye may be affected, causing some loss of vision.

Paget's disease is not associated with the following disorder:

- **Osteoporosis** – Although Paget's disease and osteoporosis can occur in the same patient, they are completely different disorders. Despite their marked differences, several medications for Paget's disease are also used to treat osteoporosis.

Who Treats It?

The following types of medical specialists are generally knowledgeable about treating Paget's disease:

- **Endocrinologists** – doctors who specialize in hormonal and metabolic disorders.
- **Rheumatologists** – doctors who specialize in joint and muscle disorders.
- **Others** – orthopaedic surgeons, neurologists, and otolaryngologists (physicians who specialize in ear, nose, and throat disorders) may be called upon to evaluate specialized symptoms.

How Is It Treated?

Drug Therapy: The Food and Drug Administration (FDA) has approved several medications to treat Paget's disease. The medications work by controlling the excessive breakdown and formation of bone that occurs in the disease. The goal of treatment is to relieve bone pain and prevent progression of the disease. People with Paget's disease should talk to their doctors about which medication is right for them.

Bisphosphonates are a class of drugs used to treat a variety of bone diseases. Of the five bisphosphonates currently available to treat Paget's disease, the most commonly prescribed are the three most potent: Actonel®*, Fosamax®, and Aredia®. Didronel® and Skelid® may be appropriate therapies for selected patients, but are less commonly used. None of these drugs should be used by people with severe kidney disease.

Actonel® (risedronate sodium) – Tablet; 30 mg once daily for two months; patients should wait at least 30 minutes after taking before eating any food, drinking anything other than tap water, taking any medication, or lying down (patient may sit).

Fosamax® (alendronate sodium) – Tablet; 40 mg once daily for six months; patients should wait at least 30 minutes after taking before eating any food, drinking anything other than tap water, taking any medication, or lying down (patient may sit).

Aredia® (pamidronate disodium) – Intravenous; approved regimen 30 mg infusion over four hours on three consecutive days; more commonly used regimen 60 mg over two to four hours for two or more consecutive or nonconsecutive days. Generic pamidronate disodium for injection is also available.

Didronel® (etidronate disodium) – Tablet; approved regimen is 200-400 mg once daily for six months; the higher dose (400 mg) is more commonly used; no food, beverages, or medications for two hours before and after taking; course should not exceed six months, but repeat courses can be given after rest periods, preferably of three to six months.

Skelid® (tiludronate disodium) – Tablet; 400 mg (two 200 mg tablets) once daily for three months; may be taken any time of day, as long as there is a two-hour period before and after eating, drinking, and taking medications.

Calcitonin is a naturally occurring hormone made by the thyroid gland. The medication may be appropriate for certain patients but is less effective than bisphosphonates and seldom used. The nasal spray form of this medication is not approved for the treatment of Paget's disease.

Miacalcin® (salmon calcitonin) – administered by injection; 50 to 100 units daily or three times per week for six to18 months; repeat courses can be given after brief rest periods.

* Brand names included in this fact sheet are provided as examples only, and their inclusion does not mean that these products are endorsed by the National Institutes of Health or any other Government agency. Also, if a particular brand name is not mentioned, this does not mean or imply that the product is unsatisfactory.

Surgery: Medical therapy before surgery helps decrease bleeding and other complications. Patients who are having surgery should discuss pretreatment with their physician. Surgery may be advised for three major complications of Paget's disease:

- **Fractures** – Surgery may allow fractures to heal in better position.
- **Severe degenerative arthritis** – Hip or knee replacement may be considered if disability is severe and medication and physical therapy are no longer helpful.
- **Bone deformity** – Cutting and realigning pagetic bone (a procedure called an osteotomy) may reduce the pain in weight-bearing joints, especially the knees.

Complications resulting from enlargement of the skull or spine may injure the nervous system. However, most neurological symptoms, even those that are

moderately severe, can be treated with medication and do not require neurosurgery.

Diet and Exercise: There is no special diet to prevent or help treat Paget's disease. However, according to the National Academy of Sciences, everyone over age 50 should get 1,200 mg of calcium and at least 400 International Units (IU) of vitamin D every day to maintain a healthy skeleton. People over the age of 70 need to increase their vitamin D intake to 600 IU. People with a history of kidney stones should discuss calcium and vitamin D intake with their physician.

Exercise is important because it helps preserve skeletal health, prevent weight gain, and maintain joint mobility. Patients should discuss any new exercise program with their doctor before beginning, to ensure that undue stress on affected bones is avoided.

Resource

For more information about Paget's disease, contact:

The Paget Foundation for Paget's Disease of Bone and Related Disorders
120 Wall Street, Suite 1602, New York, NY 10005-4001
Tel: 800-23-PAGET (free of charge) or 212-509-5335
Fax: 212-509-8492
Internet: www.paget.org
E-mail: PagetFdn@aol.com

For Your Information

This publication contains information about medications used to treat the health condition discussed here. When this fact sheet was printed, we included the most up-to-date (accurate) information available. Occasionally, new information on medication is released.

For updates and for any questions about any medications you are taking, please contact the U.S. Food and Drug Administration at 1-888-INFO-FDA (1-888-463-6332, a toll-free call) or visit their Web site at www.fda.gov.

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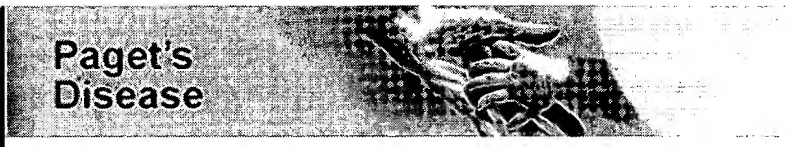
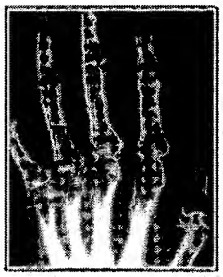


Paget's Disease



What is Paget's disease? TOP▲

- Paget's (pronounced paj-ets) disease affects bones.
- Throughout a person's life bone is constantly breaking down and growing back. With Paget's disease the normal process of bone growth is changed. The bone breaks down more quickly, and when it grows again it is softer than normal bone.
- Soft bones can bend or break more easily. The area affected by Paget's disease can become shorter because the bone bends.
- With Paget's disease the bone can also grow larger than before.
- Paget's disease can affect any bone, but usually affects the skull, the hip and pelvis bones and bones in the legs and back.

Paget's disease causes a malfunction in the normal process of bone remodelling. Normally, bone is continually breaking down and rebuilding. This usually slow process of bone destruction and growth is somehow altered in Paget's disease.

When an area of bone is destroyed in a person with Paget's disease, the bone that replaces it is soft and porous. Soft bone can be weak and easily bend, leading to shortening of the affected part of the body. The bone replacement also takes place very quickly and excess bone may be formed. This can cause the bone to get larger, be painful and break easily.

The bone affected by Paget's disease also tends to have more blood vessels than normal. This causes an increase in the blood supply to the area, and as a result the area may feel warmer than usual.

The disease can affect any bone but more commonly affects the spine,

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pelvis, skull, thighbone (femur – pronounced fee-mer) and shinbone (tibia – pronounced ti-bee-ah).

Paget's disease can lead to other medical conditions including osteoarthritis, kidney stones and heart disease.

Paget's disease is also called osteitis (pronounced ah-stee-eye-tis) deformans. It is named after Sir James Paget, an English doctor who first described the disease in 1876.

How common is Paget's disease? TOP▲

- The exact number of people with Paget's disease is not known.
- Men are more likely to be affected by Paget's disease than women.
- It usually affects people over age 40.

Paget's disease is estimated to affect 3% of people over 40. However the exact number is not known because many people who have it do not know it. It occurs all over the world but is more prevalent in some areas, such as in Europe and Australia.

It tends to affect men more than women, and usually those over the age of 40.

What are the warning signs of Paget's disease? TOP▲

- Because Paget's disease comes on slowly many people do not know they have it.
- If you have Paget's disease the first warning sign may be pain in or over a bone.
- The area may feel extra warm.
- You may feel also feel tired.
- If Paget's disease affects the bones in a leg, the shape of the bone may change and your legs may bend or bow out.
- If it affects the skull, your head may get bigger. It can also cause you to have trouble hearing.
- Paget's disease can cause your bones to break more easily.
- Often Paget's affects only one or two bones.

In many cases, Paget's disease takes a very mild course and a person with it may not have any symptoms. Those who do have symptoms may be affected in various ways.

If you have Paget's disease your bones may break easily because they are weakened. Your bones may also bend, and if your leg bones are affected you may notice that your legs bow, or a leg may appear to shrink. If your spine is involved, you may feel pain in your back. If the bones in your spine bend or grow larger than usual this can put pressure on your nerves, and you may feel pain or numbness in other areas of

your body also.

If Paget's disease affects your skull, your head may increase in size from front to back. Hearing loss may result if there is involvement of some of the small bones in the middle ear or pressure is placed on the nerves related to hearing.

In late stages of the disease, your hip joint may become damaged if the bones of your pelvis have been involved.

Usually only one or a few bones are affected. However, the disease can be widespread and affect all bones. Because of the increased number of blood vessels in bones affected by Paget's disease your heart has to work harder to pump blood to them. If many bones are affected this can cause strain on your heart and lead to other problems.

What causes Paget's disease? TOP▲

- The exact cause of Paget's disease is not known.
- Some people with Paget's disease have other family members with it.

Some studies have shown that up to 30% of people with Paget's disease have other family members with it. The disease is also more prevalent in areas where much of the population is of Anglo-Saxon descent This has led some researchers to believe there may be a genetic factor in the development of Paget's disease. A slow acting virus may also be involved, though the virus has not yet been identified.

What can you do about Paget's disease? TOP▲

- If your doctor thinks you have Paget's disease, he or she may perform a physical examination and order tests such as x-rays or blood tests.
- Your doctor may also refer you to a rheumatologist (pronounced room-a-tol-o-jist). A rheumatologist is a doctor who has received special training in the diagnosis and treatment of problems involving the joints, muscles and other parts of the body.
- Treatment is done to reduce the rate of bone loss, build up new bone and lessen pain.
- Learn as much as you can about this disease. Speaking with your doctor or other people who are specialists in arthritis care can provide you with the information you need.

At this time there is no cure for Paget's disease. Therefore treatment is designed to control the symptoms and change the rate of bone growth. Establishing the correct diagnosis is important because something can be done to manage most forms of arthritis and most therapies work best when started early in the disease.

Your doctor may be able to diagnose Paget's disease based on your medical history and a physical examination. Your doctor may order

certain tests to help confirm the diagnosis and to determine what areas of bone are affected. These tests can include x-rays, bone scans and blood and urine tests.

A diagnosis of Paget's disease may be made when you see your doctor for another problem. You may have no symptoms at this time, but routine tests may show that you have the disease.

Once diagnosed with Paget's disease you may be referred to a rheumatologist or other doctor who specializes in bone disorders, or an endocrinologist, who specializes in metabolic and hormonal disorders (which affect the rates of growth in your body).

There is no cure for Paget's disease but there are treatments that can help you manage the pain and slow the disease. Your active involvement in developing your treatment plan is essential.

Medicine

- Bisphosphonates (pronounced by-fahs-fe-nates) are often used to treat Paget's disease. These are a type of medicine that can help the body to produce normal bone.

A group of prescription drugs known as bisphosphonates have been shown to be helpful in rebuilding bone, and so are used to treat Paget's disease and other bone diseases. They reverse bone loss by causing the body to produce normal bone. The bisphosphonates often prescribed are Didronel, Fosamax and Actonel.

- Calcitonin (pronounced cal-si-tone-in) is another type of medicine that can help slow bone loss and bone growth. It also can relieve pain.

If you have severe pain and bone loss your doctor may prescribe a medication called calcitonin, which is given by injection. Calcitonin is a hormone that occurs naturally within the body. It helps increase bone density by affecting the levels of calcium in the blood. It reduces bone destruction and reduces the formation of new bone as well. It can also relieve pain. Often calcitonin from eel or salmon is used, as it is many times stronger than the human form.

- Your doctor may suggest you take acetaminophen (pronounced a-set-a-min-o-fen) if you have pain from Paget's disease. A common form of acetaminophen is Tylenol®. It relieves pain but does not change the process of bone loss.

For mild to moderate pain from Paget's disease doctors often recommend acetaminophen (Tylenol®, Panadol®, Exdol®, etc.). Acetaminophen is a pain reliever, but has no anti-inflammatory properties, so it does not actually reduce the swelling and pressure that may be causing the pain. Because it is not an anti-inflammatory it can

usually be safely taken along with most prescription medications. However, there are daily limits of acetaminophen that can be taken, so caution should be exercised, particularly if other medications that contain acetaminophen (for example, it's found in many cold remedies) are being used. A serious overdose of acetaminophen can cause liver damage.

- Non-steroidal anti-inflammatory drugs (NSAIDs – pronounced en-seds) may also be given. These are a type of medication that helps reduce pain and swelling and decrease stiffness. However, they do not prevent further damage.

NSAIDs reduce pain when taken at a low dose, and relieve inflammation when taken at a higher dose. NSAIDs such as ASA (Aspirin, Anacin, etc.) and ibuprofen (Motrin IB, Advil, etc.) can be purchased without a prescription. Examples of NSAIDs that require a prescription include Naprosyn, Relafen, Indocid, Voltaren, Feldene, and Clinoril. The various NSAIDs and Aspirin®, if taken in full doses, usually have the same levels of anti-inflammatory effect. However, different individuals may experience greater relief from one medication than another. Taking more than one NSAID at a time increases the possibility of side effects, particularly stomach problems such as heartburn, ulcers and bleeding. People taking these medications should consider taking something to protect the stomach, such as misoprostol (Cytotec).

- Calcium (pronounced cal-see-um) is a substance used by your body to build bones.
- If you have Paget's disease you should try to have a proper balance of calcium in your body.
- Your doctor may tell you to drink six to eight glasses of water or other fluid a day to keep too much calcium from staying in your body.
- However, you should also be sure to have enough calcium in your body. Eat a well-balanced diet, and foods rich in calcium.
- Foods rich in calcium are milk, cheese, yoghurt, salmon, sardines, almonds, dark green leafy vegetables and broccoli.

If you have Paget's disease you should try to have a proper balance of calcium in your body. Your doctor may advise you to drink about two litres (six to eight glasses) of fluid daily to prevent other complications arising from excess calcium in your body.

However, you should also be sure to have enough calcium in your body. Calcium can be obtained by eating a well-balanced diet that includes foods that are good sources of calcium – for example, milk and milk products, dark-green leafy vegetables (such as mustard greens and kale), and canned fish with soft bones (such as sardines and salmon). Dietary supplements of calcium may be another source.

In general, if you have Paget's disease you should receive 1000-1500 mg of calcium, adequate sunshine, and at least 400 units of vitamin D daily. This is especially important if you are being treated with bisphosphonates. If you have a history of kidney stones (calcium deposits in the kidneys) discuss calcium and vitamin D intake with your physician.

Exercise

- The pain and swelling of Paget's disease can make your joints stiff. Not using a sore joint will cause the muscles around it to become weak, resulting in more pain.
- Exercise can help decrease stiffness and keep your joints moving.
- It can also help you maintain a healthy weight, which puts less strain on your bones.
- The wrong kind of exercise could also make your condition worse. Some exercises may put you at risk of breaking bones, which can happen more easily if you have Paget's disease.
- Talk to your doctor before starting an exercise program.

Exercise may relieve stiffness and help you maintain flexibility. Always consult your doctor before beginning an exercise program. Depending on the severity of your symptoms your doctor may advise against certain exercises. He or she might refer you to a therapist, who can show you the exercises that may be helpful and those that could be harmful.

Heat/Cold

- Applying heat helps relax aching muscles, and reduces pain and stiffness. For example, take a hot shower.
- Applying cold helps to lessen the pain and swelling. For example, put an ice pack on the area that is sore.

Heat or cold application can provide temporary relief of pain. Heat helps to reduce pain and stiffness by relaxing aching muscles and increasing circulation to the area. There is some concern that heat may worsen the symptoms in an already inflamed joint. Cold helps numb the area by constricting the blood vessels and blocking nerve impulses in the joint. Applying ice or cold packs appears to decrease inflammation and therefore is the method of choice when joints are inflamed.

Protect Your Joints

- Be kind to your body. After doing heavy work, or doing the same task over and over, stop. Slow down by doing an easy task, or by taking a rest.
- Use your back, arms and legs in safe ways to avoid putting stress on joints. For example, carry a heavy load close to your body.
- Use helpful devices such as a cart to carry your grocery bags, or an enlarged handle that fits over a knife handle so you can hold it easily. A cart will help you to walk more safely. A grab bar, which attaches to a shower, will help you to get in and out of the tub more easily.
- Maintain a healthy weight to avoid putting extra stress on your bones.

Protecting your joints means using them in ways that avoid excess

stress. Benefits include less pain and greater ease in doing tasks. Three main techniques to protect your joints are:

Pacing, by alternating heavy or repeated tasks with easier tasks or breaks, reduces the stress on painful joints and allows weakened muscles to rest.

Positioning joints wisely helps you use them in ways that avoid extra stress. Use larger, stronger joints to carry loads. For example, use a shoulder bag instead of a hand-held one. Also, avoid keeping the same position for a long period of time.

Using helpful devices, such as canes, luggage carts, grocery carts and reaching aids, can help make daily tasks easier. Small appliances such as microwaves, food processors and bread makers can be useful in the kitchen. Using grab bars and shower seats in the bathroom can help you to conserve energy and avoid falls.

Staying at your recommended weight can lessen pain by reducing stress on the bones. If you plan to lose weight, discuss the best program for you with your doctor and a dietician.

Relaxation

- Relaxing the muscles around a sore area reduces pain.
- There are many ways to relax. Try deep breathing exercises. Listen to music or relaxation tapes. Meditate or pray. Another way to relax is to imagine or visualize a pleasant activity such as lying on a beach, or sitting in front of a fireplace.

Developing good relaxation and coping skills can give you a greater feeling of control over your arthritis and a more positive outlook.

Surgery

- If one of your joints becomes badly damaged your doctor may recommend surgery.
- There are different kinds of surgery. Some kinds of surgery repair or rebuild parts of the bone, or replace a joint with a man-made joint.

Some people with severe, advanced Paget's disease may require surgery, though this is rare. Benefits include less pain and better movement and function.

Some kinds of surgery can repair bone deformity or rebuild part of a joint. With other kinds of surgery joints such as hips and knees can be replaced with artificial joints..

Surgery could also be required for badly fractured bones.

Tips for Living Well TOP▲

- The Arthritis Society offers a variety of programs and services that can be helpful.
- You can reach the Society at 1-800-321-1433 from anywhere in Canada.
- You can also reach us through our Web site at www.arthritis.ca

Along with the physical symptoms of arthritis, many people experience feelings of helplessness and depression. Learning daily living strategies to manage your arthritis gives you a greater feeling of control and a more positive outlook. To get the best results, people affected by arthritis need to form close ties with their doctors and therapists, and become full partners in their treatment. From our perspective, it's all part of 'living well with arthritis.' There are several resources you can use in finding out how best to manage your own arthritis. Here are a few:

- The **Arthritis Self-Management Program (ASMP)** is a unique self-help program offered by The Arthritis Society to help you better control and manage your arthritis.
- The **Open Forum** within this Web site is an opportunity to discuss and share information with other visitors - people who, through their own experiences, may be able to offer some useful insights.

Of course, there are many other valuable **resources** for people with arthritis. If you're unclear about where to look for help, be sure to call The Arthritis Society at 1-800-321-1433.

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